

Prominence Structure and Dynamics

Judy T. Karpen
NASA GSFC

Nonerupting prominences are not dull, static objects. Rather, they are composed of fine-scale blobs and threads that are highly dynamic, often appearing to travel in opposite directions on adjacent tracks (denoted counterstreaming). Because the plasma is largely constrained to travel along the magnetic field, these cool, dense features can serve as tracers of the prominence magnetic structure, a valuable resource in view of the long-standing difficulty of observing the coronal field. Conversely, greater understanding of the fundamental magnetic geometry of filament channels can provide important constraints on the physical processes governing the accumulation, support, motion, and eruption of the cool plasma. Despite over a century of detailed observations, large gaps remain in our knowledge of filament channel/plasma formation and evolution. Resolving these issues will shed light on the physics of coronal heating, helicity transport throughout the solar cycle, and the origins of eruptive activity on the Sun. I will discuss the leading models for the magnetic and plasma structure, and outline how new observations and theory/modeling could solve long-standing uncertainties regarding this majestic solar phenomenon.